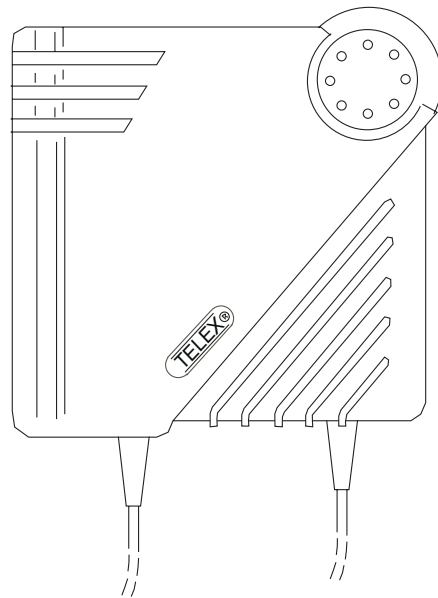


Telex

Operating Instructions



RadioCom™

**MODEL TR-200, TR-200P
WIRELESS
BELT-PACK
TRANSCEIVER**

TELEX®

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INTRODUCTION

General Description

The Telex Model's TR-200 and TR-200P Belt-pack Transceivers, are designed with one transmit and one receive channel and will operate on selected frequencies within the 150 to 216 MHz band.

The TR-200 Transceiver operates in the continuous transmit mode with the audio, or talk, activated by a switch. As many as four TR-200 belt-pack transceivers can operate in a fully duplex network with one Telex Model BTR-200 or BTR-200 II Base Station.

The TR-200P Transceiver operates in the Push-to-Transmit mode (the transmit and talk function are activated together). Any number of TR-200P transceivers can be used in a half-duplex network with one BTR-200 or BTR-200 II Base Station. Operate only one transmitter at a time. Attempting to use two transmitters simultaneously on the same channel will cause interference.

Both the TR-200 and TR-200P can be configured to operate with another TR-200 or TR-200P.

The receiver portion of the TR-200 and TR-200P consists of a crystal controlled dual conversion superheterodyne design.

The transmitter portion of the TR-200 and TR-200P consists of a crystal controlled multiplier/amplifier design.

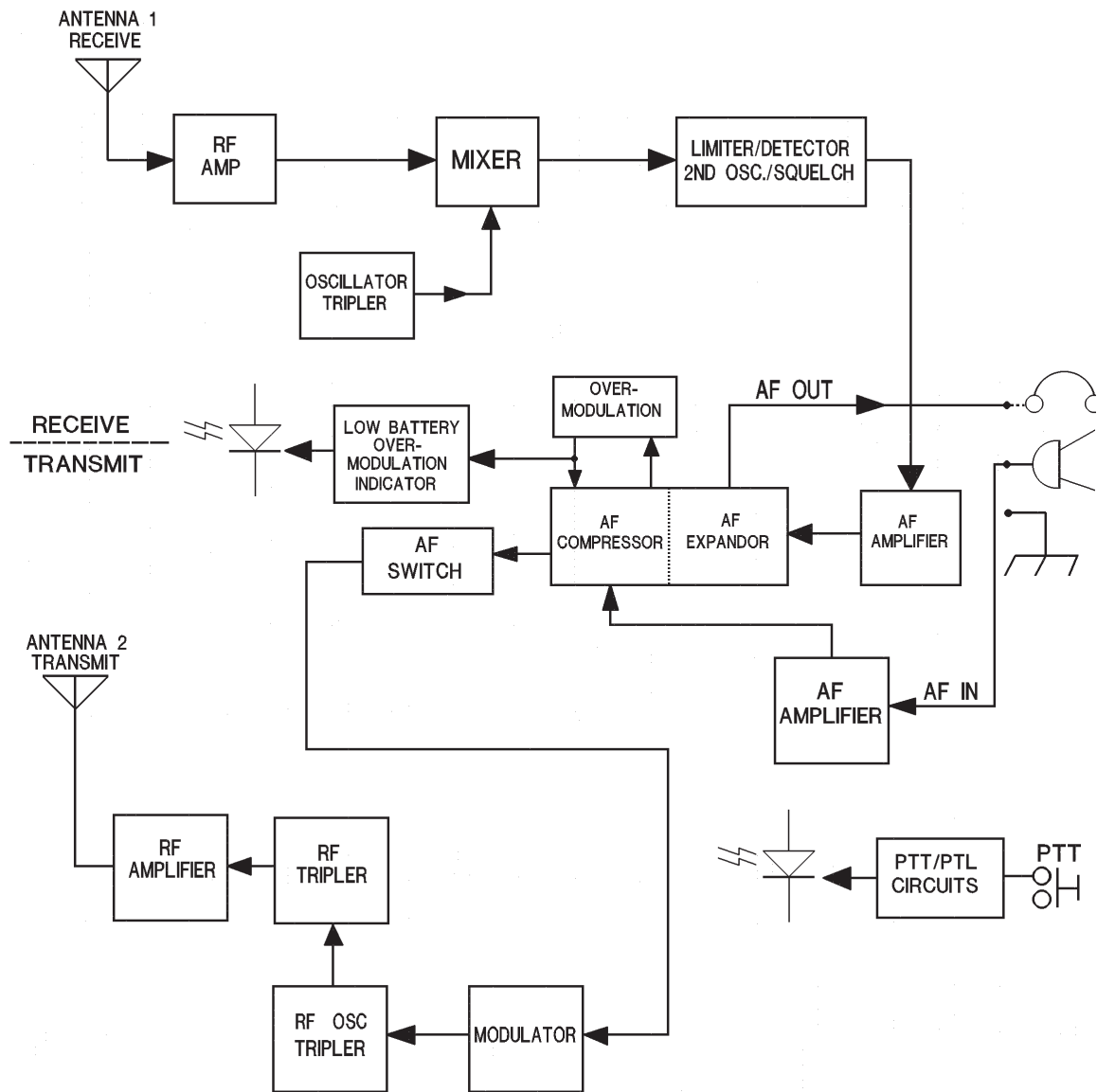


Figure 1
Block Diagram of TR-200 Transceiver

TECHNICAL INFORMATION

Controls and Connections

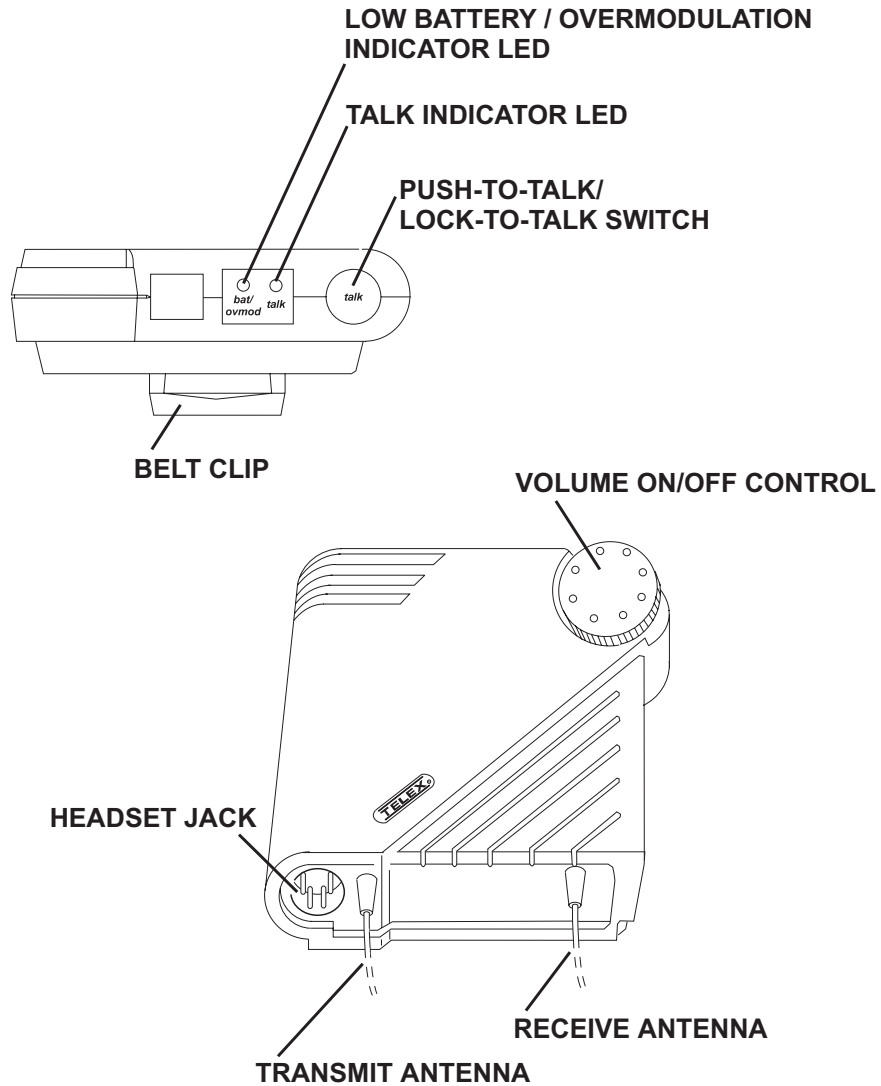


Figure 2
External controls and Connections

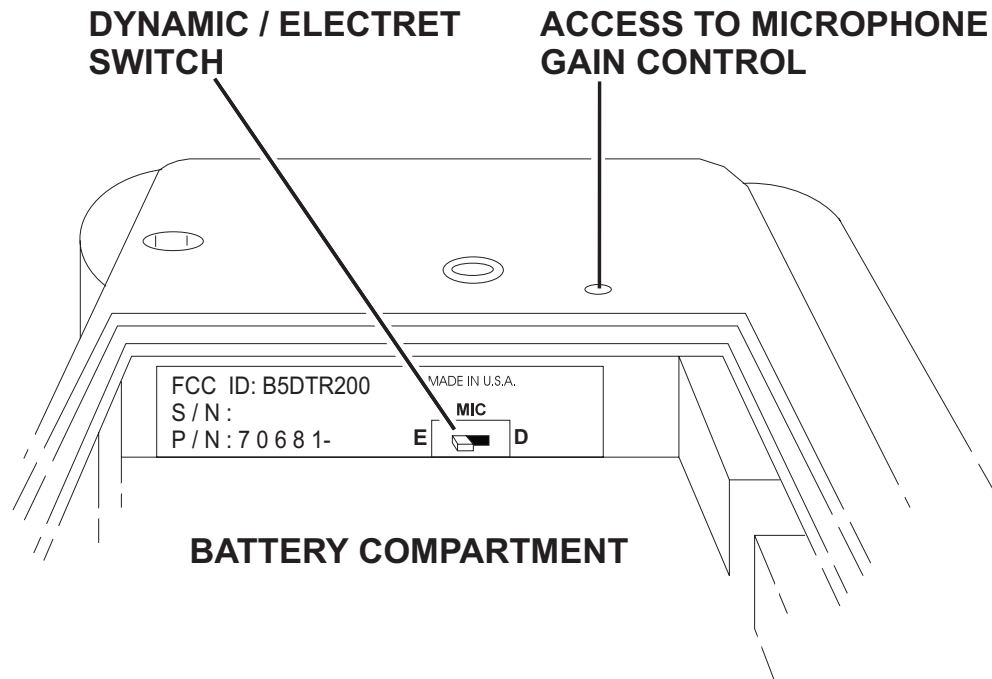


Figure 3
Internal Controls

Features

Volume ON/OFF Control: This thumbwheel control serves as both an on/off switch and as a volume control. The transceiver is turned off when the control is in the extreme counterclockwise position, when viewed from the front, and the volume is loudest when the control is in the extreme clockwise position.

Low Battery and Over Modulation Indicator LED: (labeled “bat/ovmod”)

Low Battery Indicator: Part of the battery check circuit. When the volume ON/OFF Control is placed in the “ON” position the LED will flash one time if the battery is good. A poor battery will cause the LED to illuminate continuously and a bad or unusable battery will not cause any illumination at all.

Over Modulation Indicator: Uses the same LED as the low battery indicator. During the transmit mode if microphone gain is too high the LED will illuminate when talking. Adjust microphone gain.

Push-to-Talk/Lock-to-Talk Switch:

For Model TR-200, this switch enables the talk function. Press the button and hold down as long as required (Push-to-talk function), or if continuous talk is required (lock-to-talk function), quickly press the button two times to lock on. To release the talk function, press the button one time.

For Model TR-200P, this switch enables the transmit and audio function and operates as described for TR-200.

Transmit LED Indicator: (Labeled “talk”) Will be illuminated whenever the transmit function is enabled.

Headset Jack: 4 Pin XLR Connector for Input/Output. The headset jack will accept 5 different Telex Model headsets and 1 handset. See Recommended Headsets starting on Page 14.

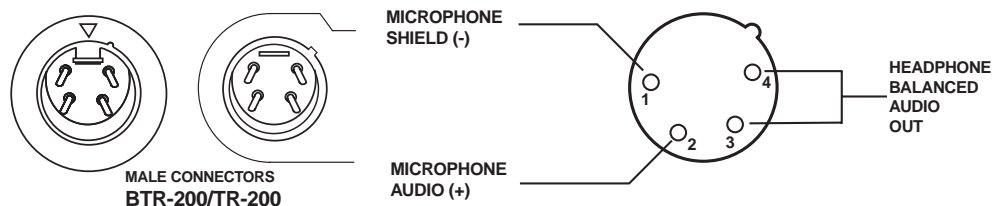


Figure 4
Headset Jack Wiring

Belt Clip: Combination Belt Clip/Battery Cover. Access to Battery Compartment, Microphone Gain Control and Dynamic/Electret Switch is accomplished by removal of belt clip via a quick release 1/4 turn fastener.(See Page 8)

Microphone Gain Control: Screwdriver adjustable by removing belt clip and prying out the small rubber plug to the right of the screw boss. Adjust the gain control clockwise to increase microphone gain or counterclockwise to decrease microphone gain. Replace rubber plug.

Dynamic/Electret Switch: Place switch towards “D” when using a Dynamic Microphone or “E” when using an Electret Microphone.

NOTE: All Telex headsets used with this intercom are dynamic microphones. Unit is shipped in the “D” position.

Battery Compartment: Holds 6 AA batteries in a removable battery holder.

SPECIFICATIONS

Overall

Power Requirements	6 AA cells (Alkaline, NEDA, MN 1500) Nickel Cadmium Optional
Current Drain.....	typical 65 mA
Temperature Range	-4°F to 130°F (-20°C to 55°C)
Dimensions.....	4.25" W x 4.125" H x 2.0" D (108mm x 105mm x 51mm)
Weight	13 oz (369g) with batteries
Transmit Antenna	1/4-wave wire (attached)
Receive Antenna.....	1/4-wave wire (attached)

Transmit

RF Frequency Range	150-216 MHz
RF Frequency Stability	Crystal Controlled, 0.005%
RF Power Output.....	50 mW Typical
Modulation	FM, 5000 Hz deviation, 100 micro-seconds Pre-emphasis
Modulation Limiter.....	Internal Compressor
Modulation Frequency Range	300 to 5000 Hz +/-2 dB
Microphone Audio Input.....	30 to 3500 ohms
Microphone Input Sensitivity	2 mV Dynamic, 4 mV Electret
Radiated Harmonics and Spurious Emissions.....	-45 dBC, Exceeds FCC Specifications
FCC Acceptance	Type Accepted Under Parts 90 and 74

Receive

RF Frequency Range	150-216 MHz
RF Frequency Stability	Crystal Controlled, 0.005%
Type	Dual Conversion Superheterodyne, FM
RF Sensitivity	Less than 0.5 μ V for 12 dB SINAD
IF Selectivity	3 dB at 30 kHz (Ceramic Filter)
Image Rejection	70 dB or better
Squelch Quieting.....	90 dB
Squelch Threshold.....	3.0 μ V (internal)
Signal-to-Noise Ratio	90 dB
Audio Output.....	32 mW into 600 ohms (Headset)
Distortion	Less than 1% at Rated Output

SET-UP

Unpacking: Unpack your TR-200 System. If there are any defects or shortages, refer to the “Warranty Service Information” section in this manual.

Headset Connection: Insert the headset/microphone into the connector on the bottom of the unit. See the microphone connection diagram (Figure 4) if unit other than Telex is used.

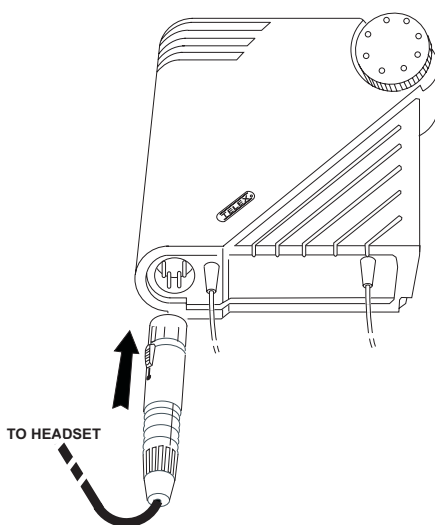


Figure 5
Connecting Headset

Dynamic/Electret Switch: If the headset you are using has an Electret microphone, the dynamic/electret switch must be in the “E” position (Electret). This switch is accessible by removing the belt clip and removing the battery holder. A +5 volt bias is available at the microphone plug for electret use.

If you are using a headset with a dynamic microphone, place the dynamic/electret switch in the “D” position (Dynamic). Refer to Figure 6.

NOTE: FOR PROPER OPERATION YOU MUST MATCH THE TYPE OF MICROPHONE YOU ARE USING WITH THE DYNAMIC/ELECTRET SWITCH LOCATED INSIDE THE UNIT.

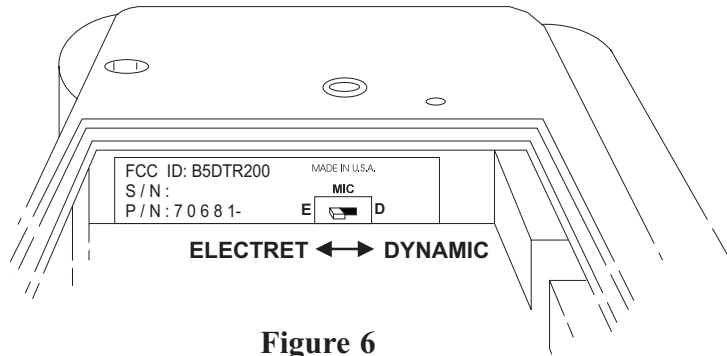


Figure 6
Dynamic/Electret Switch

Battery Installation: Assure that the OFF/ON Volume control knob is turned OFF. Gain access to the battery compartment by removing the belt clip on the back of the unit. Release the 1/4 turn fastener located on the back of the belt clip and remove the belt clip/cover. Refer to Figure 7.

Remove the battery holder from the box. Insert six (6) AA batteries in the holder, paying close attention to polarities of the batteries. It may be necessary to turn the batteries with the thumb and forefinger the first few times the batteries are inserted into the battery holder to Assure good positive contact. Insert the holder into the case and replace the belt clip/battery cover and engage the 1/4 turn fastener.

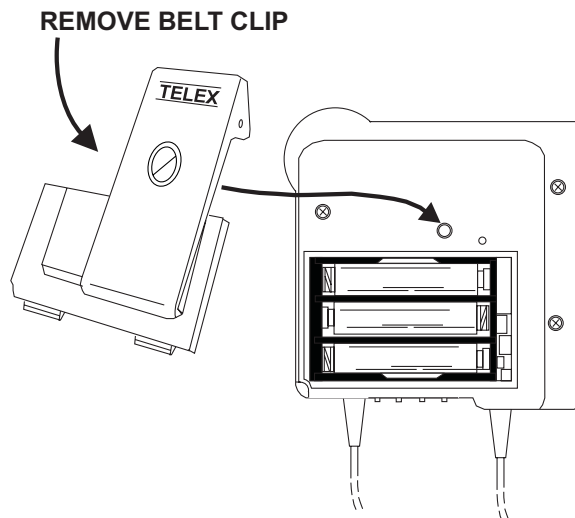


Figure 7
Battery Installation

Battery Check: Rotate the Volume ON/OFF Control knob clockwise to turn the unit on. Note that the battery LED (Labeled bat/ ovmod) should flash one time on good batteries. Poor batteries will cause the LED to be illuminated continuously and a bad or unusable battery will not cause any illumination at all.

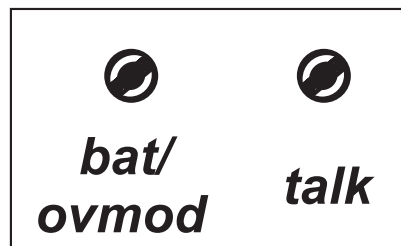


Figure 8
Low Battery Indicator LED

Battery Removal: To remove the battery holder from the case to change batteries, follow the instructions as before for removing the cover. Pull the pull bale on the holder. The holder should come out.

NOTE: For maximum uninterrupted service it is suggested that new 1.5 volt alkaline AA batteries (Mallory MN1500 or equivalent) be installed prior to each use. Avoid “shelf worn” or “economical” batteries. Operation from heavy duty nickel-cadmium batteries is also permissible, at the expense of operating time. (NEDA 10015 or equivalent). Typical life of fresh alkaline batteries with the TR-200 is approximately 24 hours maximum. 8-10 hours is typical of fully charged nickel-cadmium batteries.

NOTE: Nickel-cadmium batteries can be charged right in the holder using the Telex BC-4 Battery Charger (P/N 70741000). Refer to Battery Information Section.

Dressing the Unit: It is suggested that the unit be worn on the belt or pocket with both antenna's hung vertically for best operating range and performance.

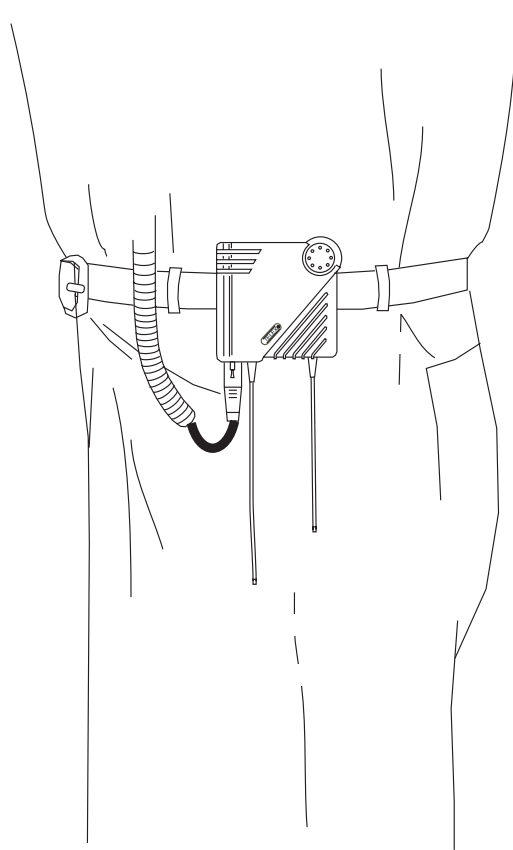


Figure 9
Dressing the Unit

OPERATION

Power: Rotate the ON/OFF - Volume Control Switch counterclockwise to turn the unit on. Refer to the Battery Check Section and check batteries.

After batteries have been checked, adjust the volume control by rotating the control either clockwise or counterclockwise as required for comfortable listening volume.

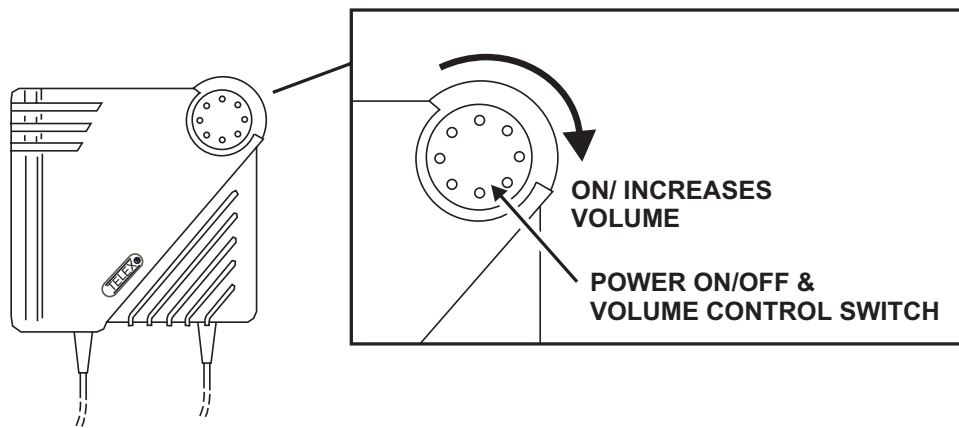


Figure 10
Power ON/OFF - Volume Control Knob

Push-to-Talk/Lock-to-Talk Switch: To enable the talk function, press and hold down on the talk button and begin talking. Releasing the talk button will discontinue talk audio. For continuous talk, quickly press the talk button twice. This enables the talk function as long as you want. To release the talk function press the talk button once more and the transmit function will cease.

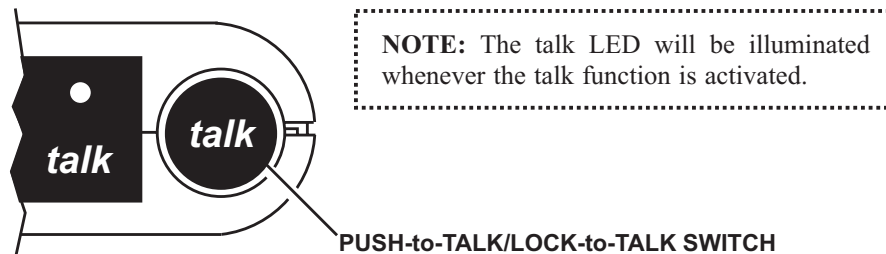


Figure 11
Push-to-Talk/Lock-to-talk Switch

Adjusting Microphone Gain: If the transmitted audio from the microphone is too high or too low, remove the belt clip on the rear of the unit and pry out the small rubber plug to the right of the screw boss. This will reveal the microphone gain control potentiometer. Using a plastic screwdriver (supplied), adjust the gain control clockwise to increase the microphone gain or counterclockwise to decrease the microphone gain. Reinstall the rubber plug and belt clip when adjustments are complete.

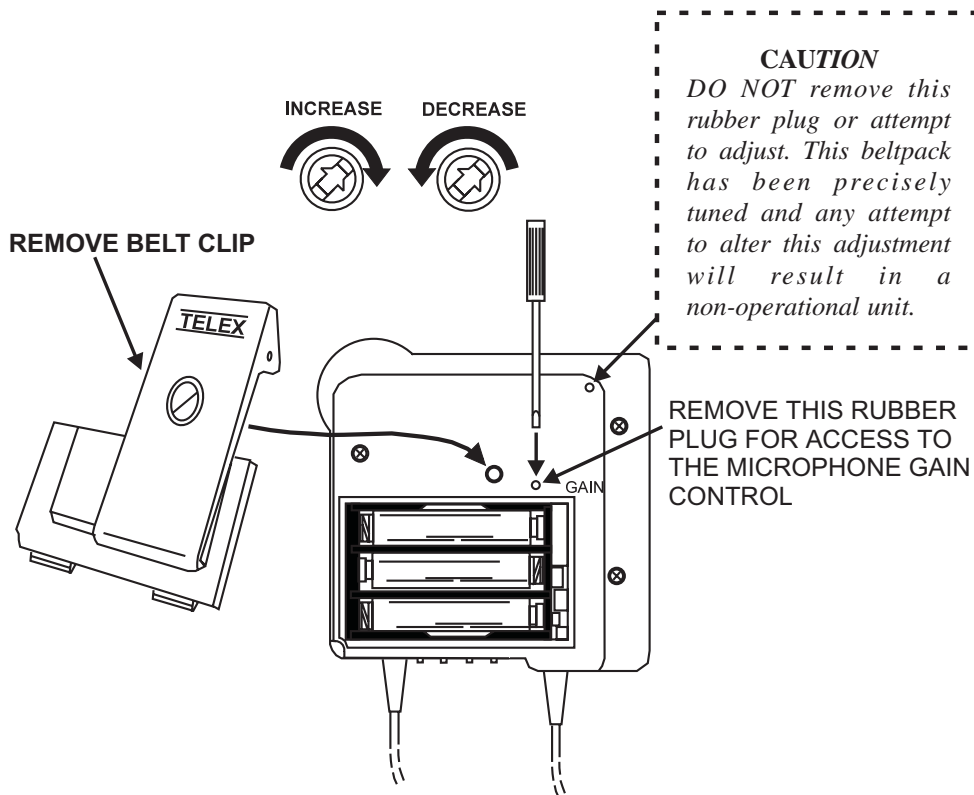


Figure 12
Adjusting Microphone Gain

If the microphone gain is too high, the over modulation LED (the Over Modulation Circuitry uses the same LED as the Low Battery Circuitry [labeled bat/ ovmod]) will be illuminated when you are talking. Decrease the Microphone Gain until this illumination ceases when talking in a normal tone.

BATTERY INFORMATION

General

Improper battery selection, use, installation and care are the cause of numerous wireless system failures.

Alkaline Batteries: Alkaline batteries such as Mallory's DURACELL or Eveready's ENERGIZER provide the most reliable operation in wireless transceivers. The use of low cost carbon-zinc batteries is NOT recommended.

Nickel-Cadmium Batteries: These batteries can save you money in the long run, as they can be recharged, but they can also cause disappointing wireless performance. If you want to use rechargeable nickel-cadmium batteries you must select a heavy duty nickel-cadmium (NEDA 10015 or equivalent)

BC-4 Battery Charger

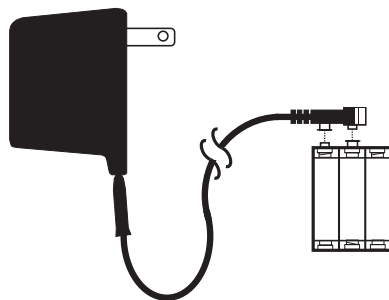


Figure 13
BC-4 Battery Charger

- Remove the battery holder from the TR-200.
- Snap the terminal connector onto the battery holder and plug the charger into a 110 Volt outlet.

Full charge of the battery pack is obtained after 14 to 16 hours. A full charge will last 8 to 10 hours. Extensive over-charging may damage or destroy the batteries. Please assure the charging time does not exceed 16 hours.

CAUTION
DO NOT ATTEMPT TO CHARGE ANY ALKALINE BATTERIES WITH THIS CHARGER. THIS CHARGER IS TO BE USED WITH NICKEL CADMIUM BATTERIES USED IN THE TR200 BATTERY HOLDER ONLY.

ENERGIZER® is a registered trademark of Union Carbide Corporation.
DURACELL® is a registered trademark of Duracell Inc.

FCC INFORMATION

The Telex Model TR-200 transceiver is Type Accepted under United States Federal communications Commission Parts 90 and 74. Licensing of Telex equipment is the user's responsibility and licensability depends upon the user's classification, user's application, and frequency selected. Telex strongly urges the user to contact the appropriate telecommunications before ordering and choosing frequencies.

CAUTION: Changes or modifications made by the user could void the user's authority to operate the equipment.

RECOMMENDED HEADSETS

V-Series (See pages 17 and 18 for Ordering Information)

Earphone Frequency Response	10 Hz - 20 kHz
Earphone Input Sensitivity	90dB @ 1 mW
Microphone Frequency Response	
Dynamic (MB-11).....	50 Hz - 15 kHz \pm 3 dB
Electret (MB-12).....	20 Hz - 20 kHz \pm 3 dB
Microphone Input Sensitivity (re: 1 volt/ μ bar)	
Dynamic (MB-11)	-87 dB
Electret (MB-12)	-84 dB
Impedance	
Earphones:.....	Mono 150 or 600 Ω Stereo 75 or 300 Ω
Microphones	150 Ω
Size H-W-D.....	8" (203 mm) x 9" (228 mm) x 4" (102 mm)
Weight	
V-200 double-sided headphone.....	14 ounces (396 grams)
V-210 single-sided headset	10.5 ounces (298 grams)
V-220 double-sided headset	15.5 ounces 439 grams)

Recommended Headsets Continued

PH-1

Catalog No.....64438-005
Earphone Type.....Dynamic/Single
Earphone Impedance.....150 ohms
Earphone Frequency Response50-15,000 Hz
Earphone Output.....105 dB
Microphone Type.....Dynamic Noise Cancelling
Microphone Impedance150 ohms
Microphone Frequency Response100-8,000 Hz
Microphone Output.....-83 re: 1V/microbar (.071 mV)
Cable Length.....6 ft. (1.8 m) coiled
Cable Connector.....Female XLR-4 type

PH-2

Catalog No.....64437-006
Earphone Type.....Dynamic/Dual/Mono
Earphone Impedance.....150 ohms
Earphone Frequency Response50-15,000 Hz
Earphone Output.....105 dB
Microphone Type.....Dynamic Noise Cancelling
Microphone Impedance150 ohms
Microphone Frequency Response100-8,000 Hz
Microphone Output.....-83 re: 1V/microbar (.071 mV)
Cable Length.....6 ft. (1.8 m) coiled
Cable Connector.....Female XLR-4 type

PH-4

Catalog No.....70340-000
Earphone Type.....Dynamic/Dual/Mono
Earphone Impedance.....150 ohms
Earphone Frequency Response50-15,000 Hz
Earphone Output.....98 dB
Microphone Type.....Dynamic Noise Cancelling
Microphone Impedance200 ohms
Microphone Frequency Response50-10,000 Hz
Microphone Output.....-89 re: 1V/microbar (.035 mV)
Cable Length.....5 ft. (1.5 m)
Cable Connector.....Female XLR-4 type

Recommended Headsets Continued

PH-8

Catalog No.....	70415-001
Earphone Type.....	Dynamic/Mono
Earphone Impedance.....	150 ohms
Earphone Frequency Response	50-15,000 Hz
Earphone Output.....	98 dB
Microphone Type	Dynamic/Noise Cancelling
Microphone Impedance	200 ohms
Microphone Frequency Response	50-10,000 Hz
Microphone Output	-89 re: 1V/microbar (.035 mV)
Cable Length.....	5 ft. (1.5 m) coiled
Cable Connector	Female XLR-4 type

PH-10

Catalog No.....	70470-003
Earphone Type.....	Dynamic/Dual Mono
Earphone Impedance.....	150 ohms
Earphone Frequency Response	50-15,000 Hz
Earphone Output.....	105 dB
Microphone Type	Dynamic Noise Cancelling
Microphone Impedance	150 ohms
Microphone Frequency Response	100-8,000 Hz
Microphone Output	-83 re: 1V/microbar (.071 mV)
Cable Length.....	6 ft. (1.8 m) coiled
Cable Connector	Female XLR-4 type

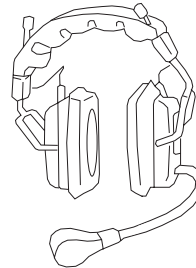
PH-16

Catalog No.	70770-003
Catalog No. (Optional liquid filled cushions)	70753-001
Earphone Type	Dynamic
Earphone Impedance.....	150 ohms
Earphone Frequency Response	15-15,000 Hz
Earphone Output.....	105 dB
Microphone Type	Dynamic Noise Cancelling
Microphone Impedance	150 ohms
Microphone Frequency Response	100-8,000 Hz
Microphone Output.....	-83 re: 1V/micobar (.071 mV)
Cable Length.....	6 ft. (1.8 m) coiled
Cable Connector	Female XLR-4 type

ACCESSORIES

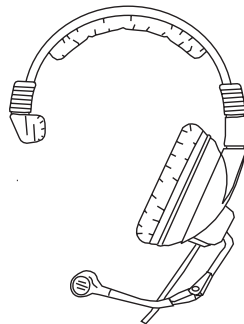
Headsets

PH-1	Order No. 64438-005
PH-2	Order No. 64437-006
PH-4	Order No. 70340-000
PH-8	Order No. 70415-001
PH-10	Order No. 70470-003
PH-16	Order No. 70770-003



V-series Headsets

V-210 Single sided headset with boom	Order No. 300027-001
V-220 Double sided headset with boom	Order No. 300027-002

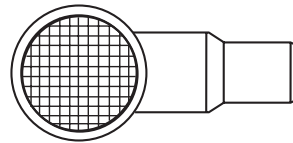


V-Series Headphone

V-200 Double sided headphone	Order No. 300027-000
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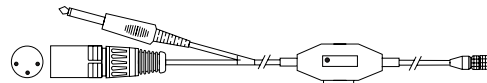
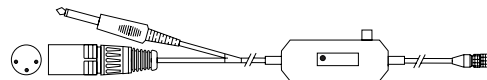
V-Series Microphone Cartridges

MB-11 Supercardioid Dynamic	Order No. 300028-000
MB-12 Supercardioid Electret	Order No. 300028-001



V-Series Cord Assemblies

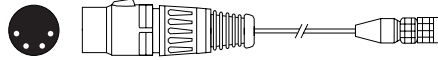
CA-10 XLR-3 Male & 1/4" 5' straight cord w/Power Supply & PTC for electret	Order No. 300029-007
CA-11 XLR-3 Male & 1/4" 5' str. cord w/PTC switch for dynamic	Order No. 300029-011
CA-12 Carbon amp w/PTT/PTC & 1/4" ring-tip-sleeve connector	Order No. 300029-012



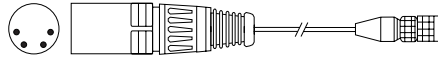
ACCESSORIES (Continued)

V-Series Cord Assemblies (Continued)

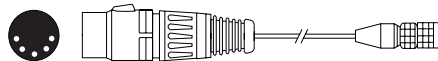
CA-20 XLR-4 Female 5' cord
Order No. 300029-001



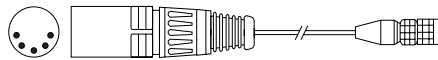
CA-22 XLR-4 Male 5' cord
Order No. 300029-000



CA-30 XLR-5 Female 5' cord
Order No. 300029-009



CA-33 XLR-5 Male 5' cord
Order No. 300029-004



CA-40 Sony mini 4-conductor 1/8" 5' cord
Order No. 300029-006



CA-50 1/4" Mono 5' cord
Order No. 300029-005



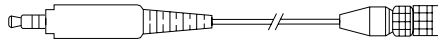
CA-60 1/4" Stereo 5' cord
Order No. 300029-003



CA-70 Pig Tail 5' cord
Order No. 300029-002



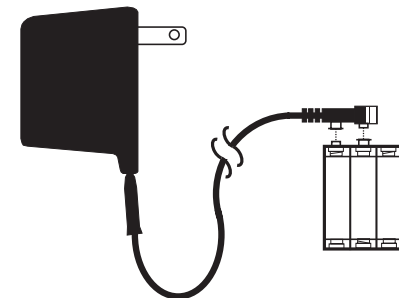
CA-80 1/8 mini stereo 5' cord
Order No. 300029-010



Nicad Battery System:

Includes; Charger, batteries and battery sled. For charging nickel-cadmium batteries used in the TR-200

BC-4 Order No. 70741-000

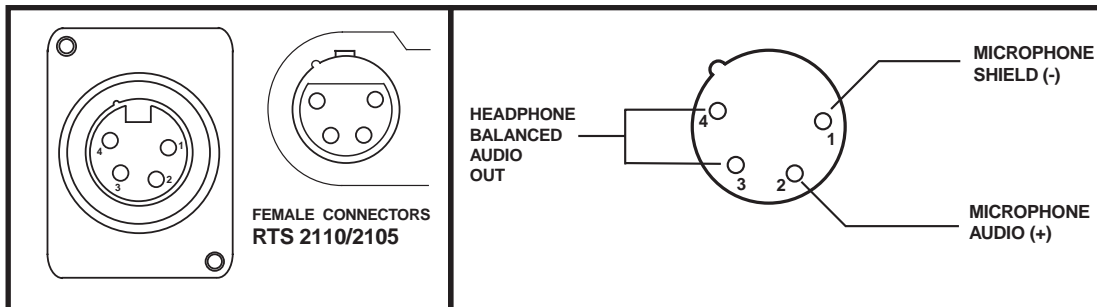


Belt Clip Replacement

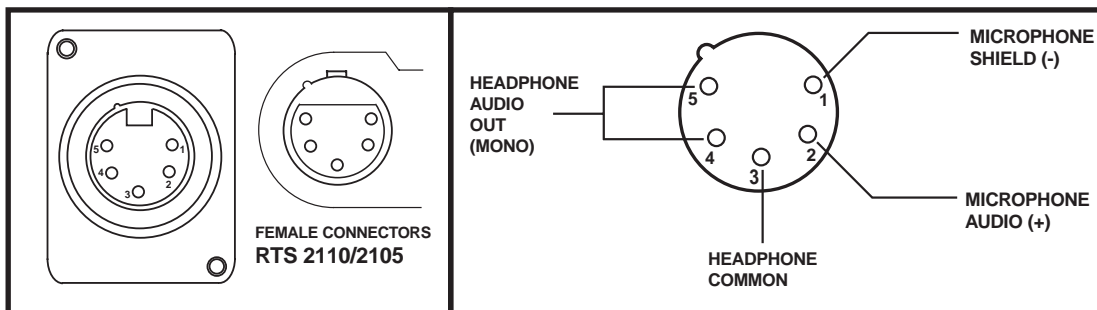
Gray Order No. 96605-001

Black Order No. 96605-000

NOTE: This manual is also used for the RTS version 2110/2105 Intercom system which uses a different headphone jack. Use the illustrations below in place of Figure 4 of page 5.



RTS 2110/2105 4-Pin Headset XLR Connector



RTS 2110/2105 5-Pin Headset XLR Connector

CUSTOMER SERVICE INFORMATION

If your receiver or transmitter should need servicing under the warranty, please contact:

Customer Service Department
TELEX COMMUNICATIONS, INC.
8601 East Cornhusker Highway,
P.O. Box 5579,
Lincoln, Nebraska 68505-5579 U.S.A.
Phone: (402) 467-5321 or 465-7021

All claims of defect or shortage should be sent to the above address. When returning items for service, you must provide date and proof of purchase, such as a copy of the sales receipt, to establish warranty. A letter should be included outlining all symptoms and claimed defects. Information on how the equipment was installed and used is very helpful. Please include your phone number and return address in case our service technicians need to contact you.

Units that have been modified cannot be accepted for repair.

Include all information requested by the Service Department. Then pack the unit as follows:

Check the unit to see that all parts and screws are in place. Then wrap it in heavy paper or put it in a plastic bag. If the original carton is not available, place the unit in a strong carton that is at least six inches bigger in all three dimensions than the unit. Fill the carton equally around the unit with resilient packing material (shredded paper, foam, etc.). Seal it with gummed paper tape, tie it with a strong cord, and ship it by prepaid express, United Parcel Service or insured parcel post to the Telex Service Department.

It is very important that the shipment be well-packed and fully insured. Damage claims must be settled between you and the carrier and this can delay repair and return of the unit to you.

Telex reserves the right to make changes in design and improvement on its product without assuming any obligation to install the same on any of its products previously manufactured. Further Telex reserves the right to ship new and/or improved products which are similar to the form, fit and function of products originally ordered.

TELEX[®]

TELEX COMMUNICATIONS, INC. 12000 Portland Ave. South, Burnsville, MN 55337, U.S.A.

MADE IN U.S.A.

APRIL 1998

PN 802205-2